

CLAIMS

What is claimed is:

1. A magnetic element comprising:

a plurality of layers, a portion of the plurality of layers including at least one magnetic layer, the plurality of layers including a top and a plurality of sides; and

a passivation layer covering at least a portion of the plurality of sides.
2. The magnetic element of claim 1 wherein the passivation layer further covers a portion of the top of the plurality of layers.
3. The magnetic element of claim 1 wherein the magnetic element resides on a surface and wherein the passivation layer further covers a portion of the surface residing next to the magnetic element.
4. The magnetic element of claim 1 wherein the plurality of layers further include a pinned layer, a free layer, and an insulating layer residing between the pinned layer and the free layer.
5. The magnetic element of claim 1 wherein the passivation layer further includes Si_3N_4 .

6. The magnetic element of claim 1 wherein the passivation layer further includes AlN.
7. The magnetic element of claim 1 wherein the passivation layer further includes Ta₃O₄.
8. The magnetic element of claim 1 wherein the passivation layer further includes Si_xN_yH_z, where x, y, and z are numbers.
9. The magnetic element of claim 1 wherein the passivation layer further includes Al_xO_y, where x and y are numbers.
10. The magnetic element of claim 1 wherein the plurality of layers includes an insulating tunneling barrier composed of at least one material having a first stoichiometry and wherein the passivation layer includes the at least one material having the first stoichiometry.
11. A magnetic memory comprising:

a plurality of magnetic elements, each of the plurality of magnetic elements including a plurality of layers and a passivation layer, a portion of the plurality of layers including at least one magnetic layer, the plurality of layers including a top and a plurality of

sides, the passivation layer covering at least a portion of the plurality of sides; and

a plurality of word lines, each of the plurality of word lines residing below a portion of the plurality of magnetic elements.

12. A magnetic memory comprising:

a plurality of magnetic elements, each of the plurality of magnetic elements including a plurality of layers and a passivation layer, a portion of the plurality of layers including at least one magnetic layer, the plurality of layers having a top and a plurality of sides, the passivation layer covering at least a portion of the plurality of sides; and

a plurality of word lines, each of the plurality of word lines residing above a portion of the plurality of magnetic elements.

13. A method for providing a magnetic element comprising:

(a) providing a plurality of layers, a portion of the plurality of layers including at least one magnetic layer, the plurality of layers including a top and a plurality of sides; and

(b) providing a passivation layer covering at least a portion of the plurality of sides.

14. The method of claim 13 wherein the passivation layer providing step (b) further includes the step of:

(b1) providing the passivation layer that further covers a portion of the top of the

plurality of layers.

15. The method of claim 13 wherein the magnetic element resides on a surface and wherein the passivation layer providing step (b) further includes the step of:

(b1) providing the passivation layer that further covers a portion of the surface residing next to the magnetic element.

16. The method of claim 13 wherein the plurality of layers providing step (a) further includes the steps of:

(a1) providing a pinned layer,

(a2) providing an insulating layer; and

(a3) providing a free layer, the insulating layer residing between the pinned layer and the free layer.

17. The method of claim 13 wherein the passivation layer providing step (b) further includes the step of:

(b1) providing a layer including Si_3N_4 .

18. The method of claim 13 wherein the passivation layer providing step (b) further includes the step of:

(b1) providing a layer including AlN.

19. The method of claim 13 wherein the passivation layer providing step (b) further includes the step of:

(b1) providing a layer including Ta_3O_4 .

20. The method of claim 13 wherein the passivation layer providing step (b) further includes the step of:

(b1) providing a layer including $Si_xN_yH_z$, where x, y, and z are numbers.

21. The method of claim 13 wherein the passivation layer providing step (b) further includes the step of:

(b1) providing a layer including Al_xO_y , where x and y are numbers.

22. The method of claim 13 wherein the plurality of layers includes an insulating tunneling barrier composed of at least one material having a first stoichiometry and wherein the passivation layer includes the at least one material having the first stoichiometry.